

G A R D E N S



*Arbor
Judith A. Resnick Elementary School
Montgomery County Public Schools*

Case Study: Gardens

The Judith A. Resnick Elementary School in Montgomery County was an attractive new brick school wrapped around a 80' x 120' courtyard crisscrossed with concrete paths and dotted with unremarkable vegetation. Corridor and classroom windows looked onto the courtyard; the media center and corridor doors open into it. But there was nothing to see and no reason to enter it. In 1995, with the support of the principal and staff, the PTA undertook as its goal a three year transformation of the courtyard into an outdoor science center/garden. The purpose of this effort was to provide hands-on opportunities to enrich and supplement classroom instruction. With the help of a wildlife specialist, they developed a wishlist of features which included ponds (a control and an experimental site), raised-bed gardens (approximately 40 of their 630 students are orthopedically disabled), an extensive arbor to provide shade and to act as a climbing structure for vines, a Colonial Maryland herb garden (including medicinal, culinary, and dye plants), a butterfly garden, a wildflower garden, a weather station, a composting site, seed planting areas, and wildlife habitat.

The plan was implemented in stages. First, the ponds were dug. They were placed next to the corridor windows where passing children could see the new pond lilies unfold into bloom and monitor the darting native fish. Next, the existing alkaline soil was heavily amended to allow the planting of native (acid-loving) plants. This took a year of planning, fundraising, and working. A biologist parent took the lead in coordinating the project. Her family lived across the street and spent endless hours developing and tending the courtyard. (A plan for rotating the care during the summer, using a different family a week worked better on paper than in reality).

In the next phase a crane lifted timbers over the school building to create the arbors. Native vines were planted at the bases of the uprights. A shed for garden tools was added as were covered plastic vermin-proof composting bins (to which children add their lunch scraps). Raised beds, at wheelchair height, were filled with composted leaf soil, and planted with quick-crop vegetables. Bird feeders and a sundial in which children stand to make the shadow add to the educational opportunities.



*Raised, ADA Accessible Garden
Judith A. Resnick Elementary School
Montgomery County Public Schools*



*Exploring the Garden
Judith A. Resnick Elementary School
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Children have been involved in all phases of maintenance and in monitoring the growth and changes in the courtyard. Monthly newsletters keep the staff and community abreast of any interesting developments. An annual "Courtyard Guide" has been published and distributed to all staff members, complete with a reduced copy of the original plan and with information on all of the resident plants and animals. At first, only a few teachers used the courtyard, but usage has increased substantially as the curricular connections have become apparent.

Contribution to Educational Programs

Gardens discussed in this section are of the traditional flower-and-vegetable type, familiar to many adults, and found around many homes in borders and containers. Adult familiarity is a great advantage of these gardens -- many teachers and aides feel they can guide children in the process of selecting, planting, and tending to plants so readily available in garden stores. The job of facility planners, architects, landscape architects, and curriculum planners is to facilitate school gardening through thoughtful design.

Gardening is a worthwhile pursuit for children and adults of all ages and abilities. As a vehicle for interdisciplinary environmental education, gardens are excellent. Many science, math, social studies, and language arts goals for Maryland students can be approached through gardening. Understanding of life cycles and the interdependence of living organisms and the non-living environment are examples. Because gardening is such a flexible, adaptable activity there is no set of specifications, but rather a set of guidelines to be adapted for different aged children and different school sites.

Planning, Design, and Construction

Locating Gardens

Gardens need light, water, appropriate soil, drainage, and protection (e.g., from balls, foot traffic, and roof drainage). If possible, school gardens should be located close to classrooms so they can easily be tended and monitored by children and teachers. Gardens must be accessible to individuals with disabilities. Secure storage space for tools and equipment should be nearby, as well as provision for properly vented and protected composting. Water must be easily accessed.

IDEAS FOR GARDENS

Native American Three Sisters: corn, beans, squash
Salsa: hot peppers, tomatoes, cilantro, onions
Quick Salad: leaf lettuce, radishes
Butterfly: native plants to attract native butterflies
One Color: choose a color and see how many shades exist
Wildflower: include black-eyed Susan, Maryland's state flower
Colonial Maryland: medicinal, culinary, and dye plants
Persian Rug: children make a pattern and plant it with flowers
Multicultural: plants or seeds from children's countries of origin
Alphabet: marigold's for "M", etc.
Xeriscape: plants that once established survive with little or no watering

Table 6

Classrooms in many schools have doors that lead directly outdoors, providing access to gardens. Gardens should be located far enough away from structures to allow children to work on all sides of the garden. In new construction, each garden should have a water supply; retrofitting can extend an existing water supply to the outside of the building.

Courtyards are prime garden locations as they can provide security for the gardens and equipment shed, access to water, low traffic, and interesting views for adjacent rooms or corridors. Materials used in courtyards should be selected to control excessive heat from the sun. Retrofitting courtyards may be more difficult than adding to the perimeter of the building (e.g., delivering large lumber for a courtyard arbor or new soil and timbers for raised beds).

For an extensive garden area, one elementary school created 108 4x6 foot plots, located a storage shed/greenhouse with multiple hose bibs in the center, and ringed it with a fence including a locked gate. There was a garden plot for every four children. Secondary schools, particularly ones with a related educational focus, may require a similarly large area for curriculum.

Providing water is necessary if extensive gardening is foreseen. It is vital that water is close to the gardens, otherwise the labor of tending the plants becomes too burdensome for all but the most dedicated teachers, students, and parents.

Flower and vegetable gardens require a minimum of 5-6 hours of sunlight. The garden area must be carefully selected to avoid long periods of shade from the school building or from trees.

Gardens should be a permanent part of the school design and should not be located where expansion is slated to occur. Good gardens should last for years with the soil constantly being improved and perennial growth encouraged and monitored. Gardens typically require a great deal of work by teachers, parents, and custodians; providing permanent locations for gardens respects and sustains this work.

If children's gardens are to be considered a positive part of the landscaping of the school, just as children's art is considered desirable interior decor, similar aesthetic standards need be applied. If there is a preference for a formal landscape in highly visible areas, such as the main entrance, locate children's gardens less conspicuously.

Soil - In new construction, some of the site's topsoil should be reserved for school gardens, a step which is both practical and provides an authentic basis for growing native species. In adding gardens to existing buildings, fresh soil and amendments will usually be required, particularly if beds are near the buildings where soil is usually poor. Bulk top-soil is of uneven quality and therefore, should be purchased carefully. A composting program will contribute to soil quality in an ongoing garden program.

Inexpensive soil testing by the Cooperative Extension Service provides information on minerals, nutrients, and pH values. Lead testing is recommended for older school sites. If lead is present, replacing existing soil with fresh soil is the only alternative.

Types Of Beds - Garden beds range from ground level to wheelchair accessible level. Raising a bed 8-12" high delineates it from its surroundings so it is not disturbed by pedestrian traffic. The top should be

suitable for sitting (wide and smooth, with rounded edges). Some beds for prekindergarten and elementary school children should be 22-28" high to meet the requirements of the Americans with Disabilities Act for accessibility. For secondary school children, a 20-30" bed height will provide accessibility. The advantages to raising beds are protecting their contents, especially in high activity areas, allowing drainage, and simplifying soil preparation. For ideas on accessible gardens, see The Enabling Garden (page D-2, References).

The size and shape of beds vary enormously depending on the site. Narrow rectangles allow children to work easily without getting into the garden. If squares and circles are used, paths are needed. One school created a large square garden available to young children by using large tiles to create a checkerboard of soil and working spaces where children could kneel and sit. A series of planters can be arranged to give children the interest of pathways.

Obviously, cost varies with the size and materials used. A recently constructed 4'x12'x3' bed using 6"x6" timbers, lined with filter fabric (to prevent soil from seeping between the timbers) cost about \$1000 for materials and labor. See Play for All Guidelines (page D-2, References) for further ideas on creative garden design for schools.

Plantings - Plantings vary according to the goals set for the garden. A class of 4-year-olds may want all red flowers, chosen from seed catalogues; a class of second graders may want to select plants in hopes of attracting butterflies as part of their life cycle studies; a kindergarten class studying nutrition wants a vegetable garden; a fourth-grade teacher may want to plant colonial species to enrich a social studies focus on Maryland history; the art teacher may want a sunflower bed to link with paintings by Monet, O'Keefe, and VanGogh; and social studies and science teachers may want only native species to teach a sense of place and environmental sensitivity. Well designed and constructed gardens accommodate all these curricula.

Long Term Maintenance

The most common downfall of school gardens is lack of maintenance when school recesses for the summer.

There are two ways to handle this potential problem. The first approach is to have someone, or ones, tending the garden: a community group, e.g., a Boy Scout Troop, the same dedicated parents and teachers who started the garden, a summer school teacher, or a school neighbor. Access to water and good mulching go a long way to making the job easier for these gardening stalwarts. If considerable funds and time have been invested in perennials and shrubs, such on-going maintenance is necessary.

The second approach is to use the garden only for plants that mature by May having been planted earlier in the fall or spring (peas, lettuces, radishes, pansies, and bulbs such as tulips) and for plants that can be planted in late August or September and mature by the end of October (spinach, beets, chard and lettuce from seed, broccoli from seedlings). When fall vegetables are harvested, spring bulbs and pansies can be planted. When peas are planted, potatoes can be also planted -- being fairly sturdy they might make it through the summer untended and can be a total delight to dig up in September. A big garden might have room for Heritage raspberries that do not need significant tending, bear fruit in the fall, and are trimmed down before the next growth in the spring. If there is space for sprawling, planting and mulching, pumpkin seeds might provide a fall crop, given any luck with summer rain for watering.

If the decision is for no summer growing, the garden should be cleaned up and mulched as school closes in June to avoid an unsightly weed patch the seeds of which will haunt all future efforts. A fall clean-up is necessary and fall is also a good time to add in the compost that has been accumulating.

Student Participation

Working within the considerations suggested above, secondary students can contribute substantially to making gardens; elementary students are more appropriately provided good beds in which to experiment with varieties of plants and arrangements. With a good bed, children can devise many interesting conditions of soil, light, water, and temperature to study plant growth, as well as help decide the type of garden.